I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on

September 27, 2004

Roberta A. Winzeler
(Name)

Roberta A. Winzeler
(Signature)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: JULIA MACLACHLAN	) GROUP ART UNIT: 1733
SERIAL NO.: 09/997,347	) EXAMINER: JESSICA L. ROSSI
Filing Date: November 29, 2001	) Attorney Docket: 1-15092
For: METHOD OF USING SHORT WAVELENGTH UV LIGHT TO SELECTIVELY REMOVE A COATING FROM A SUBSTRATE AND ARTICLE PRODUCED THEREBY	)

September 17, 2004

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. §1.131

Honorable Sir:

I, Julia B. MacLachlan declare as follows:

1. I am the inventor of the pending claims of the above-identified patent application. I am currently, and have at all times relevant hereto, been employed by Pilkington North America, Inc., the assignee of the subject application.

2. This declaration is to establish completion of the invention in this application in the United States at a date prior to February 8, 2001, the earliest filing date of an application related to Published U.S. Patent Application No. 2003/0024180 to Hartig et al.

3. Prior to February 8, 2001, I conceived the idea of a method for removing a hydrophobic coating from a glass substrate by exposing said coating to short wavelength UV light.

In this regard, a true copy of an invention disclosure document authored by me prior to February 8, 2001 with the actual date redacted is attached as Exhibit A.

4. Prior to February 8, 2001, I conducted experiments related to the removal of hydrophobic coatings from a glass substrate which were recorded in lab notebook 795. In this regard, attached are true copies of p129 477 as Exhibit B. From these experiments, I was able to author the document referred to in paragraph 3, herein.

5. Prior to February 8, 2001 Ushio, the supplier of the UV light source utilized by applicant, conducted certain testing on samples having hydrophobic coatings thereon. The samples upon which Ushio performed its tests were provided by PNA. Ushio's tests showed significant change in contact angle. The results were recorded at Ushio report Irradiation test Pilkington Tech. Sept. 20002.xls (Exhibit C).

6. Thus, prior to February 8, 2001, I reduced to practice the method to remove hydrophobic coatings using short wavelength UV light disclosed in the above-captioned application.

7. Tests regarding the differences in adhesion of an item to glass treated with short wave-length UV light were conducted at my direction prior to February 8, 2001 as shown in Exhibit D attached hereto.

8. The undersigned further declares that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section

1001 of title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 9/17/04

Julia B. MacLachlan

PILKINGTON

LIBBEY-OWENS-FORD CO.

DISCLOSURE AND RECORD OF INVENTION

1. Name of discloser:

   Julia MacLachlan

2. Position of discloser:

   Senior Scientist

3. Department or plant:

   Glazing Systems, Plant 21

4. Name of the invention:

   Use of very short wave UV light (172nm) for selective removal of hydrophobic coating from glass

5. Inventor(s) Name and Address:

   Julia MacLachlan
   7041 Blossman Drive, Toledo, OH43617

6. Date of conception:

   6/22/00

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DISCLOSURE AND RECORD OF INVENTION

7. Disclosure to others (give names and dates):

6/22/00 Sam Sahi
7/12/00 Jeff Williams (Lathom)
7/1700 George Bukovinszky
7/19/00 Scott Chambers
7/19/00 Steve Knight (Applied Laser Technology)

8. First sketch (give date and attach a copy):

7/24/00 Letter to Steve Knight

9. First written description (give date and attach a copy):

As #8

10. Date of completion of first device or material:

6/28/00 Testing of 1065nm laser at PNA Technical Center (unsuccessful)
8/9/00 Testing of 248nm laser at Applied Laser Technology (unsuccessful)
9/25/00 Testing of 172nm lamp at Ushio (Japan) (successsful)

11. First test of invention (give date and general result):

9/25/00 Measurement of water contact angle on treated samples at Ushio Japan – water contact angle was reduced from around 110° to 10-25° by treatment. Report received by e-mail from Ushio America, Inc.

12. Names of all persons having knowledge of such test:

Scott Chambers, George Bukovinszky, Al Lipper (Ushio America, Inc.), Shinji

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DISCLOSURE AND RECORD OF INVENTION

Kameda (Ushio Japan).

13. First commercial use, if any:

14. Drawing, photograph, notebook page, report or order numbers:

Irradiation Test Pilkingston Tech.Sept.20002.xls received by e-mail from Ushio Japan. Dated print outs (6/22/00) of related information from Internet.

15. Purpose of invention (include, if known, what has been suggested and used before for the same purpose, either by LOF or others):

Selective removal of hydrophobic coating from glass in order to be able to bond structural adhesives or encapsulation material to the glass in this area. Currently glass is masked prior to coating in areas to be bonded. Work at NSG used plasma etching to try to remove the coating but the cycle times were slow and it was not possible to remove coating from ground edge of glass. A further alternative is the use of chemical etchants to remove the hydrophobic layer, but there are numerous health and safety issues associated with the extremely aggressive chemicals required for this.

16. Complete description of invention. Include: (a) advantages of invention and how it is distinguished from what is old; (b) description of any known or potential commercial applications of the invention in the Company's operations; (c) description of any known or potential licensing opportunities.

172nm laser light has been used (in academic institutions, initially Johannes

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DISCLOSURE AND RECORD OF INVENTION

Kepler University in Linz, Austria) to etch the surface of Teflon in order to increase its surface energy to make it easier to facilitate bonding. This wavelength is used because it gives the correct energy to break a C-F bond. The outer layer of hydrophobic coatings usually consists of a long chain fluorosilane . The C-F bonds contained therein should also be susceptible to cleavage by 172nm light. Lasers of this wavelength are not yet commercially available so other wavelengths were tested which were available locally or from custom laser shops. However, these were not successful so a source of UV lamps with high intensity at this wavelength was located. Initial testing by Ushio Japan gave a significant reduction in water contact angle implying an increase in surface energy at short exposure times. Future work will concentrate on adhesion testing of treated samples, treating of ground edge of glass, increasing light intensity to further reduce cycle times and automation of the process. If this is successful this process could eliminate the need for masking of the glass prior to coating, which is very labour intensive.

Discloser: Julia Maclachlan Date: 2/10/00 (oct)

Witness: Scott [signature] Date: 2·10·00

Patent Committee Action:

Date: __________

EXHIBIT B

LIBBEY-OWENS-FORD COMPANY · *Research Department*

LABORATORY NOTEBOOK

№ 1294

Subject: Hydrophobic Removal Using

Title: Laser Light.

Project No. 557

Julia Nachlach

SIGNATURE AND 12/23/00

OBJECTIVE: References in literature suggest use of 174nm laser light (see app.) for etching Teflon to increase surface energy.

Internet search on laser & etching instigated partly after seeing Sam Sahis use of laser light to etch logo (frit removal).

Prepared hydrophobic glass for Sam (see app.) to try & etch.

Sam used 1064 nm light, but was not able to get any effect on coating despite testing different intensities & exposure times.

Could not find 174nm laser for purchase or testing on Internet. But Applied Laser Tech (see app.) are a laser job shop & believed they had the correct equipment.

However, the shortest wavelength available was 248nm but A.L.T. were not able to get any effect on coating.

Never think that you're not good enough yourself. A man should never think that. People will take you very much at your own reckoning. — Anthony Trollope

- Commitments
- Journal Entry
- Thoughts & Ideas
- Agendas
- Conversations

9 Wednesday August 2000

Daily Record of Events 222nd Day 144 Left Week 32

Applied laser tech: Tried many diff. exps using 248nm no luck.

CONCLUSIONS:

Y-OWENS-FORD COMPANY • *Research Department*

LABORATORY NOTEBOOK

№ 129477

Hydrophobic Removal Using Laser Light.

Project No. 5574

Julia MacLachlan

SIGNATURE AND DATE 12/23/00

TIVE: References in literature suggest use 174nm laser light (see app.) for etching Teflon to increase surface energy.

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• Commitments • Journal Entry • Thoughts & Ideas • Agendas • Conversations

9 Wednesday August 2000

Daily Record of Events 222nd Day 144 Left Week 32

Applied laser tech: Tried many diff. exps using 248nm — no luck.

ONS:

TAPED IN LAB NOTEBOOK.

N5.9
ECONOMICAL SURFACE MODIFICATION OF FLUOROCARBON RESIN FOR HYDROPHILIC PROPERTY WITH PRELIMINARY MODIFICATION BY USING 172nm Xe_2* EXCIMER LAMP.
Ken Hatao* and Masataka Murahara**; *Tokai University; **Faculty of Electrical Engineering, Tokai University, Kanagawa, JAPAN.

Fluorocarbon resin is chemically a high stable polymer that consists of C F bonds. It has excellent properties of electric insulation, thermal and chemical resistance. With these properties, it is noticed for its possibility of applications as compound materials such as a high voltage resistance compound material and high frequency print circuit board. However, its surface repels both oil and water and has poor adhesion. We have photochemically modified a fluorocarbon resin surface into hydrophilic by using ArF excimer laser in order to improve its adhesive strength. In this paper, for simpler and safer modification, we successfully demonstrated a more efficient surface modification of fluorocarbon resin with a preliminary treatment. Water or $B(OH)_3$ solution dropped on a fluorocarbon resin surface, which was covered with a fused silica glass to form a thin layer by a capillary phenomenon. Then, 172nm Xe_2* excimer lamp light irradiated perpendicular to the interface between the fluorocarbon resin and the. reaction solution to modify preliminary. The fused silica glass was removed, and water or $B(OH)_3$ was exclusively dropped onto the irradiation area; which was irradiated with ArF excimer laser (wavelength =193nm) perpendicularly. The hydrophilic property of the modified surface was evaluated by measurements of contact angle with water. With preliminary modifcation time of three minutes, ArF excimer laser fluence of $10mJ/cm^2$ and laser shot number of 3000, we successfully achieved a contact angle of 50 degrees on the preliminary modified surface after the excimer lamp irradiation and a contact angle of 30 degrees on the surface further irradiated with ArF excimer laser, whereas the non-treated fluorocarbon resin surface has a contact angle of about 120 degrees.

08/08/2000

http://www.mrs.org/meetings/fall97/abstract_book/N/node36.html

Using UV Irradiation to Bond to Teflon

Linz (FWF) - Fluor polymers, better known as Teflon, can be used in a variety of applications, but they have one serious drawback: they are extremely slippery. This is an advantage in pots and pans, but a problem for science and research. Whether components, pigments or glues - nothing sticks to this material. With the financial assistance of the Austrian Science Fund (FWF), Johannes Heinz from the Johannes Kepler University in Linz has developed a new method, in which laser radiation is used to modify Teflon surfaces and make them sticky.

Everyone knows Teflon and appreciates its benefits. The fields of application range from coatings on frying pans, electrical insulation layers, sliding surfaces and medical inserts to water-repellent textiles. The great advantage of this material is its low chemical reactivity and the extremely low adhesion of liquids to Teflon coatings. But this advantage is also its greatest disadvantage. It has not been possible to modify small, specified areas on fluor polymer surfaces in such a way that glues or metallic coatings stick to them.

This circumstance has limited the use of Teflon substrates in microelectronics, where strong adhesion of contacts is required, or in medical engineering. Heinz achieved the desired effect by irradiating the surface of fluor polymers with UV light of extremely low wavelength, so-called vacuum UV light (172 nm): 'The material is modified only in those places where it will be glued or coated.

Until now, such modifications were possible only on large surface areas. The chemical reaction takes place only on the surface and the Teflon retains its major property, namely its extremely low adhesion'. The modified materials combine the new surface properties with the desired characteristics of the unmodified residual material, such as excellent electrical insulation for electronics applications, or resistance to aggressive chemicals, or thermal stability.

This is of special advantage in medical engineering, where the application of UV irradiated fluor polymers significantly facilitates the use of artificial blood vessels, grafts, cardiac valves or artificial skin. The new technology ensures tissue adhesion and compatibility on the outer surface, while preventing the blood from clotting on the inner surface. The method is also interesting for the textile industry and the microelectronics industry, where excellent adhesion of metallic objects and contacts is a major prerequisite for any material.

EXHIBIT C

MacLachlan, Julia B

From: Lipper, Al [alipper@Ushio.com]
Sent: Monday, September 25, 2000 1:37 PM
To: jmaclachlan@lof.com
Subject: Lets try again
Categories: Hydrophobic Removal

Hello Julia;

I sent you a nice e-mail and forgot a few things! It is starting to be one of those days! I hope this one gets to you, and you understand the data. Let me know if you need more information or do not understand anything. The file names have been changed (to protect the innocent), only kidding, but you should be able to figure out which is which.

Pictures in the file
PIC00007 is showing the surface of sample glass. The half of the glass is very wettable and the other half is
hydrophobic which is not irradiated (covered by mask to show the surface difference).
PIC00005 is how I did the irradiation test.
PIC00004 is when the lamp goes on.

Test report is also attached. The title is "Irradiation Test Pilkington Tech.2000" is stating the test result.

Best Regards,

Al Lipper
Manager, Systems Sales Dev.
Ushio America, Inc.
5740 Cerritos Ave.
Cypress, CA 90630
714-229-3172 Phone
714-229-7172 Fax
alipper@ushio.com

<<IrradiationTest Pilkingston Tech.Sept.20002.XLS>> <<PIlkington2.JPG>> <<PIlkington1.JPG>>
<<PIlkington.JPG>>

Excimer Irradiation Test 9/25/00

Sample work

1)Silica

Irradiation T	Distance	C/ A	Initial (	sample#
20sec.	3mm	30	96	P543
	2mm	50	110	P543
	1mm	24	100	P543
40sec.	1mm	14		P543

2)Teflon like
(Dark coloured)

Irradiation T	Distance	C/A		sample#
0sec		98		P579
30sec	1mm	26		P579
60sec	1mm	10		P579
90sec	1mm	8		P579

Light source:Excimer Photon source
Irradiation Intensity:20mw/cm2
Temperature:27° C

MacLachlan, Julia B

From: Durbin, Janet E
Sent: Wednesday, November 29, 2000 5:08 PM
To: MacLachlan, Julia
Cc: Durbin, Janet E
Subject: UV treated glass testing; lap shear and tensile

Attached are the test results from the lap shear and tensile samples from the glass coupons that were UV tested. Samples will be in the second drawer in the humidified lab marked "Julia's samples".

Please see me if there are questions.

UVlapshear.xls (21 KB) UVtensile.xls (21 KB)

INSTRON TESTING			Samples for Julia			
Lap Shear testing			test speed = .3937 inches per minute (10 mm/minute)			
	Sample Identification		Sample Identification		Sample Identification	
Adhesive and Material	Essex 2 component adhesive					
Production Date	11/28/2K					
Substrate	1 x 6 glass					
Substrate Frit	3513					
Substrate Temp (F)	ambient					
Weathering	none					
Conditioning	24 ambient					
Test Date	11/29/2K					
	Load	Failure Mode	Load	Failure Mode	Load	Failure Mode
Specimen # 1	215.7	100ADG				
Specimen # 2	680.7	50PG/50AP				
Specimen # 3	638.2	glass shattered				
Specimen # 4	816	glass shattered				
Average Load	587.7		#DIV/0!		#DIV/0!	
Std. Dev.	259.3		#DIV/0!		#DIV/0!	
Comments:	#1 no UV exposure					
	#2 60 sec. UV exposure					
	#3 90 sec. UV exposure					
	#4 120 sec. UV exposure					
	All exposure @ 0 mm distance					

% FAILURE MODE KEY: CH = Cohesive failure ADH = Adhesive failure TT ="tail" tear
ADR = ADHESIVE FAILURE RUBBER ASG = ADHESIVE FAILURE GLASS

INSTRON TESTING			TECHNICIAN: J. Durbin			
Tensile testing			speed = .3937 inches per minute (10 mm/minute)			
	Sample Identification		Sample Identification		Sample Identification	
Adhesive and Material	Essex 2 component adhesive					
Production Date	11/28/2K					
Substrate	3 x 3 glass					
Substrate Frit	3513					
Substrate Temp (F)	ambient					
Weathering	none					
Conditioning	24 @ ambient					
Test Date	11/29/2K					
	Load	Failure Mode	Load	Failure Mode	Load	Failure Mode
Specimen # 1	133.2	100ADG				
Specimen # 2	932.2	50V*/50ADF				
Specimen # 3	542.3	glass shattered/20V*				
Average Load	535.9		#DIV/0!		#DIV/0!	
Std. Dev.	399.5		#DIV/0!		#DIV/0!	
Comments:	#1 no UV exposure					
	#2 60 seconds UV exposure					
	#3 90 seconds UV exposure					
	All exposure @ 0 mm					
	* adjusted for void					

% FAILURE MODE KEY: CH = Cohesive failure ADH = Adhesive failure TT ="tail" tear
ADR = ADHESIVE FAILURE RUBBER ADG = ADHESIVE FAILURE GLASS